Medication Error Reporting and the Work Environment

LTC Patricia A. Patrician, AN
Chief, Nursing Research Service
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Research Team

- Associate Investigator: COL Laura Brosch, AN
- Project Director: James A. Williams, BBA
- Consultants:
  - Bonnie Wakefield, PhD, RN
  - Douglas Wakefield, PhD
  - Linda Aiken, RN, PhD
  - Paul Allison, PhD

Objectives

- Justify the conduct of the Medication Error Reporting Study
- Examine the results of the Medication Error Reporting Study conducted at WRAMC in 2002.
- Discuss the outcomes of the study.

Introduction

- *To Err is Human* – Institute of Medicine report on medical errors (2000):
  - All medical errors: 8th leading cause of death, resulting in 44,000 - 98,000 deaths annually
  - Medication errors account for an estimated 7,000 deaths per year nationally
  - Human beings make mistakes
  - Mistakes can be prevented by designing systems “that make it hard for people to do the wrong thing and easy for people to do the right thing.”

Introduction

- To design such systems and evaluate their effectiveness, we need to start with baseline information
- Reporting of medication errors is crucial…
- …but traditionally punitive
- Studies conclude that 45-95% of medication errors are not reported
- If reporting is inadequate, we cannot identify problems

Study Purposes

- To determine nurses' perceptions of:
  - Reasons why med errors occur
  - Extent of med error reporting
  - Reasons for non-report
  - Their work environment
- To compare formal incident reports with anonymous mini-surveys/coupons in terms of error reporting
- To explore the relationship between the work environment and medication error reporting
- To examine the relationships between staffing, workload, unit activity levels and medication error occurrence at the shift level

Sample

- RNs and LPNs
- Work at least 2 days/week on that unit
- 14 inpatient units
- One academic military medical center

Methods

- Briefings to explain study
- Cross-sectional survey, returned by mail
- Shift coupons (mini-surveys) completed over a 30-day period

Cross-sectional Survey

- Two demographic questions
  - Years experience and unit tenure
- Questions about floating to other units and rotating shifts

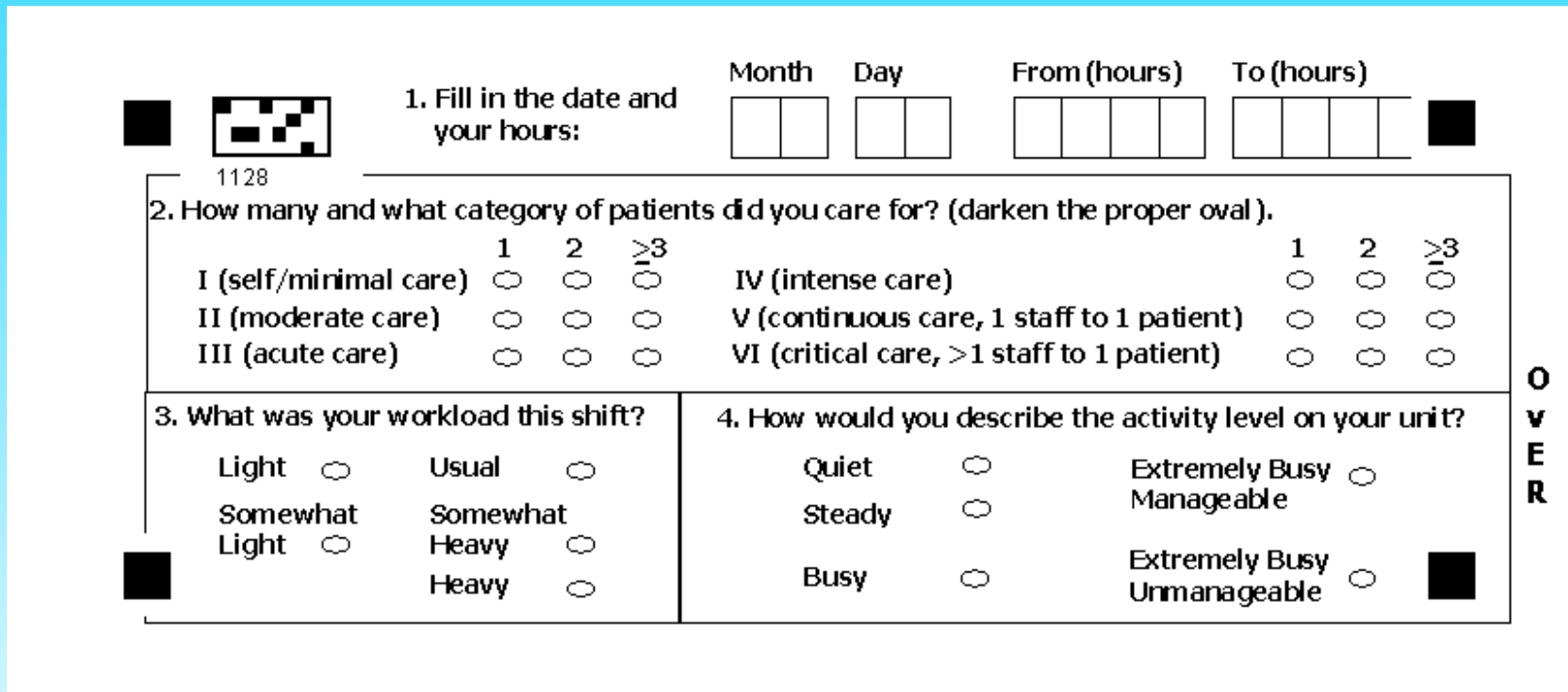
Cross-sectional Survey

- **Medication Administration Error Survey** (Wakefield et al., 1999)
  - Six category response: SD = 1 to SA = 6
  - Subscales: Fear, Administrative Response, Disagreement over Error, Reporting Effort
- **Nursing Work Index, Revised** (Aiken & Patrician, 2000)
  - Four category response: SD = 1 to SA = 4
  - Subscales: Administrative Support, Resource Adequacy, Nurse-MD Collaboration, Composite Professional Practice Index

Longitudinal Coupons

- Medication Error Coupon book: forty perforated coupons
  - Shift start and end time and date
  - Number of patients assigned and acuity
  - Workload (1=light. . . 5 = heavy)
  - Unit activity level (1 = quiet. . . 5 = extremely busy, unmanageable)
  - Medication error (or near miss) occurrence
  - Who caused, discovered, prevented error
  - Type of error

Coupons



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1. Fill in the date and your hours: Month Day From (hours) To (hours)

2. How many and what category of patients did you care for? (darken the proper oval).

	1	2	≥3		1	2	≥3
I (self/minimal care)	⬭	⬭	⬭	IV (intense care)	⬭	⬭	⬭
II (moderate care)	⬭	⬭	⬭	V (continuous care, 1 staff to 1 patient)	⬭	⬭	⬭
III (acute care)	⬭	⬭	⬭	VI (critical care, >1 staff to 1 patient)	⬭	⬭	⬭

3. What was your workload this shift?

Light ⬭ Usual ⬭

Somewhat Light ⬭ Somewhat Heavy ⬭

Heavy ⬭

4. How would you describe the activity level on your unit?

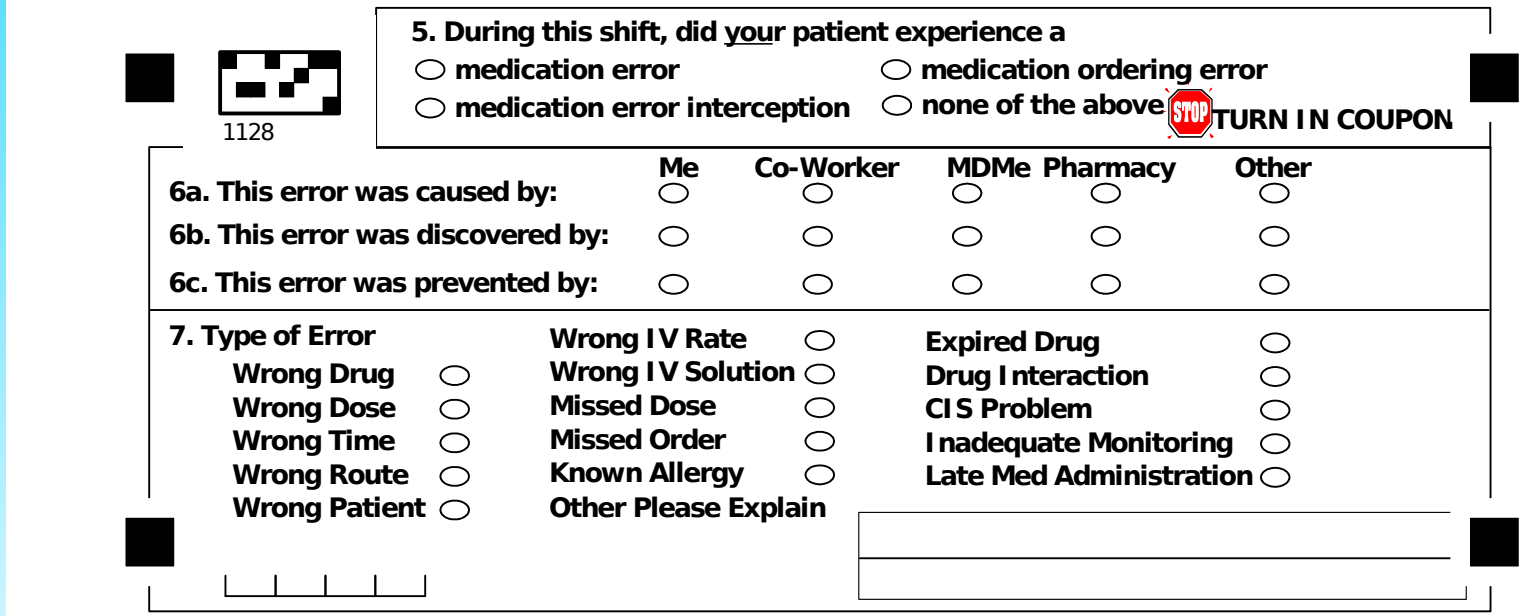
Quiet ⬭ Extremely Busy Manageable ⬭

Steady ⬭

Busy ⬭ Extremely Busy Unmanageable ⬭

OVER

Coupons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5. During this shift, did your patient experience a
medication error
medication ordering error
medication error interception
none of the above
STOP
TURN IN COUPON
Me
Co-Worker
MD
Me
Pharmacy
Other
6a. This error was caused by:
6b. This error was discovered by:
6c. This error was prevented by:
7. Type of Error
Wrong Drug
Wrong Dose
Wrong Time
Wrong Route
Wrong Patient
Wrong IV Rate
Wrong IV Solution
Missed Dose
Missed Order
Known Allergy
Other Please Explain
Expired Drug
Drug Interaction
CIS Problem
Inadequate Monitoring
Late Med Administration

Confidentiality/Anonymity

- Very little demographic information was requested on the survey
- No attempt was being made to identify individuals – the survey numbers identified a unit and a person (

Response Rates

- Survey

Surveys distributed: 268

Returned: 43

Response rate: 16%

Range by ward: 0-45%

- Longitudinal Coupons

Shifts worked: 4125

Returned: 462

Response rate: 11.2%

Range by ward: 3.5-26%

Sample Characteristics

	Mean (SD)
Nursing experience: years	11.60 (11.02)
Unit tenure:	4.88 (7.85) years

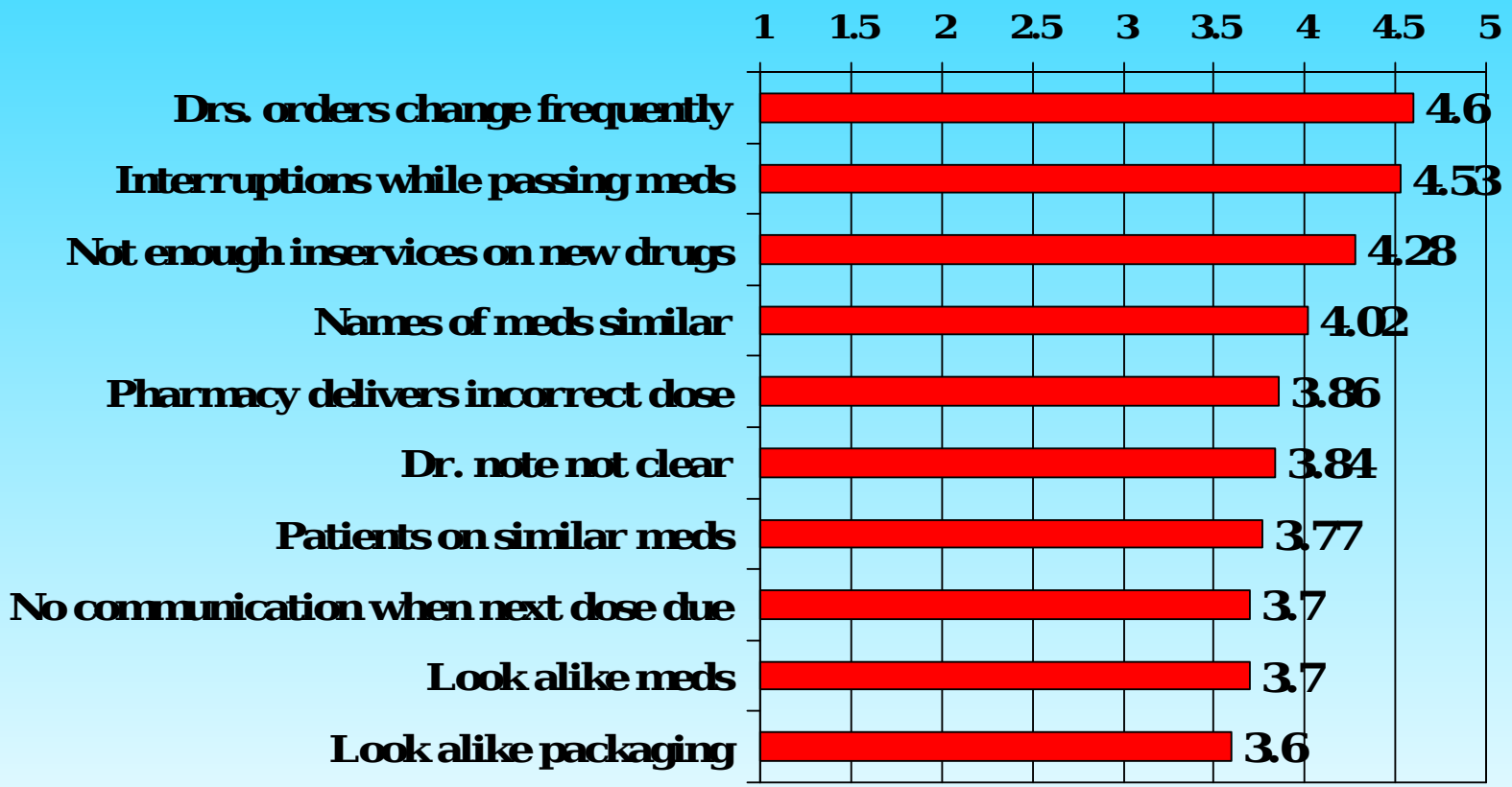
Sample Characteristics

In the past two weeks:

- How often did you float? Not 33 (80%)
  Once 4 (10%)
  More than twice 4 (10%)

- Rotate shifts? Not 22 (51%)
  Once 12 (29%)
  Twice 4 (10%)
  More than twice 4 (10%)

Reasons for Medication Errors



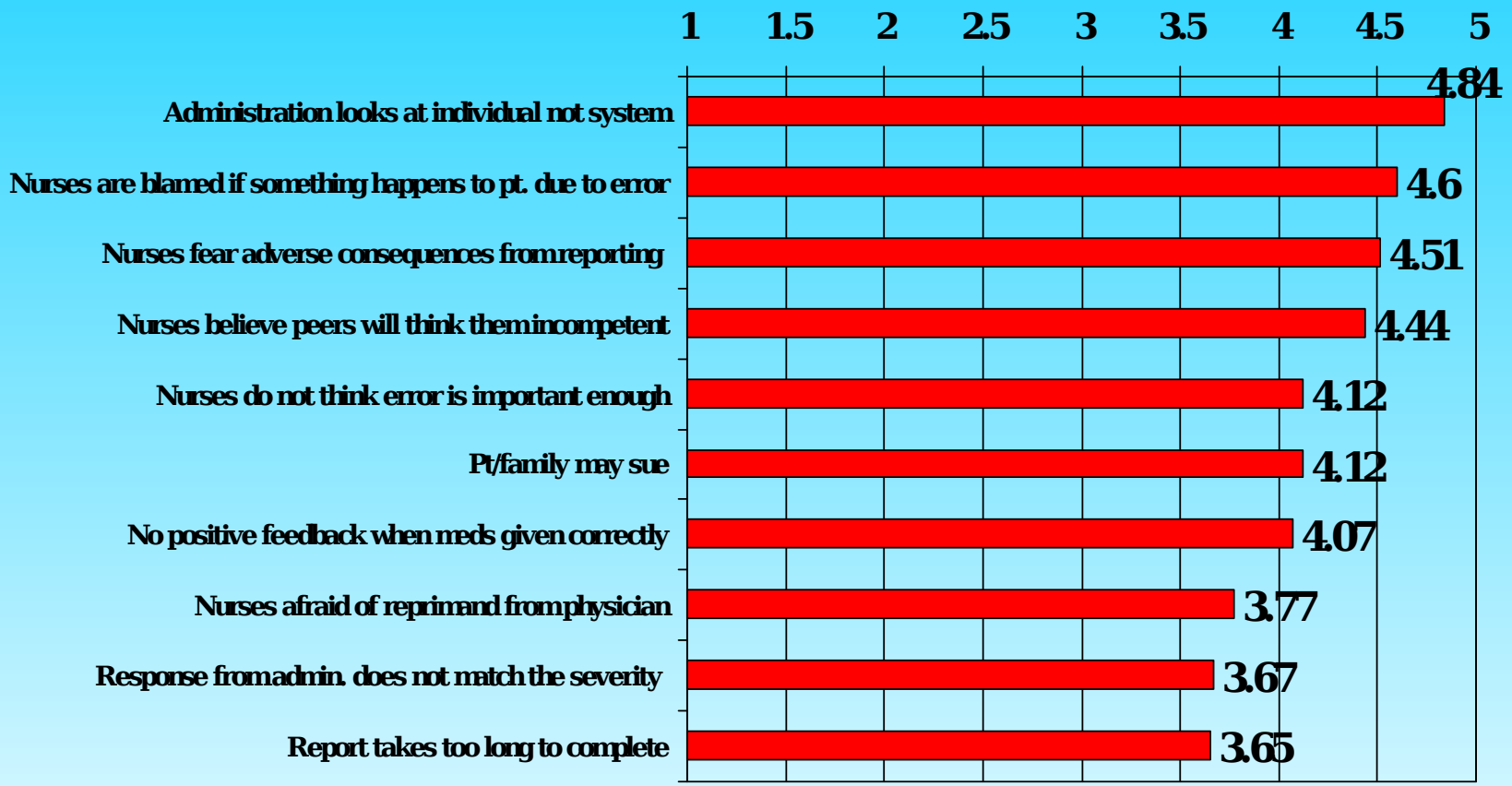
Reasons for Medication Errors

- Items that were not rated highly (not an issue):
  - legibility of doctor's orders
  - nurses not adhering to proper procedure
  - limited knowledge about meds
  - pharmacy availability
  - abbreviations
  - knowledge of allergies
  - equipment malfunction
  - inability to pass all meds in allotted time frame.

What percentage of medication errors are reported on your unit?

Response category	N	%
0-20%	16	38.1
21-40%	12	28.5
41-60%	4	9.6
61-80%	5	11.7
81-100%	5	11.9

Why are med errors not reported?



Why are med errors not reported?

- Items that were not rated highly (not an issue):
  - agreement about definition of error
  - recognition of error
  - contacting the MD takes too long

Medication Administration Error Survey: Subscales (N=43)

Subscale	Items	Alpha	Mean (SD)
Fear	5	.89	4.29 (1.33)
Administrative Response	4	.64	4.04 (1.02)
Disagreement over Error	4	.72	3.32 (1.09)
Reporting Effort	2	.65	3.06 (1.16)

Subscale Score Comparison between WRAMC and 29 Iowa Hospitals*: Reasons for Not Reporting Med Errors

(Means and SDs are reported)

	WRAMC	Iowa
• Fear	4.3 (1.33)	3.4 (1.2)
• Admin. Response	4.0 (1.02)	3.4 (1.1)
• Disagreement over Error	3.3 (1.09)	3.0 (1.1)
• Reporting Effort	3.1 (1.16)	2.9 (1.4)

*Wakefield et al (1999)

The Work Environment: NWI-R Subscales (N=43)

Subscale	Items	Alpha	Mean (SD)
Administrative Support	5	.89	2.73 (.79)
Resource Adequacy	4	.73	2.71 (.61)
Nurse-Physician Collaboration	3	.83	2.81 (.69)
Composite Index	21	.94	2.65 (.49)

Incident Reports vs. Coupons

	Incident Reports	Anonymous Reports	Matched Reports (Incident + Anonymous)
Error	14	108	6 (6%)
Near Miss	10	40	6 (15%)
Totals	24	148	12 (8%)

Errors (Coupons)

How many errors were reported?

462 Coupons returned

108 Errors were reported (23% of all coupons)

75 Were nurse committed errors

Types of Nurse Committed Errors (Coupons)

Type	f
Wrong time	15
Missed dose	13
Wrong dose	11
Late medication	10
Wrong IV rate	7
Wrong IV solution	4
Wrong route	3
Wrong patient	3
Missed order	3
Wrong drug	2
Computer problem	2
Inadequate monitoring	2

Medication Error Reporting and the Work Environment: Subscale Correlations

	Admin Support	Resource Adequacy	Ns-MD Collab.	Composite Index
Fear	-.28	-.10	-.25	-.27
Admin. Response	-.41**	-.15	-.33*	-.47**
Disagreement over Error	-.03	.16	.07	-.01
Reporting Effort	-.22	.13	-.10	-.17

*p ≤ .05, **p ≤ .01

Frequency of Medication Error Reporting: Reasons for Non-Report

- Percent of medication errors reported was significantly correlated with the following:
  - Fear ($r = -.63$, $p = <.001$)
  - Administrative Response ($r = -.40$, $p = .008$)
- Percent of medication errors reported was *not* related to:
  - Disagreement with Error
  - Reporting Effort

Frequency of Medication Error Reporting: Work Environment

- Percent of medication errors reported was significantly correlated with the following work environment attributes:
  - Nurse-Physician Collaboration
    (r = .33, p = .04)
- Percent of medication errors reported was *not* related to:
  - Administrative Support
  - Resource Adequacy
  - NWI-R Composite Index

Workload and Staffing

Variable	Mean	SD	Range
Acuity score	9.02	6.24	1-63
Workload	3.19	1.02	1-5
Unit activity	2.50	0.95	1-5
Total HPPD	4.96	3.02	1.10-24
RN skill mix	0.6	0.22	0.14-1

Factors that Predict Medication Errors Multivariate Logistic Regression Analysis using Generalized Estimating Equations (N=423 shifts)

Variable	Odds Ratio	95% CI	p
Acuity score	0.97	(0.92, 1.02)	.35
Workload*			
Unit activity	1.32	(0.98, 1.02)	.07
Total HPPD*			
RN skill mix	0.21	(0.06, 0.80)	.02

*Variables not entered into model due to multicollinearity.

Conclusions

- Reasons for medication errors are not always apparent from incident report data
- Errors are under-reported
- Punitive culture prevents error reporting
- Nurse-physician working relationships may affect error reporting

Conclusions

- RN Skill mix had a significant and substantial effect on the occurrence of medication errors committed by nurses.
- Unit activity levels although not statistically significant when other factors are taken into account, may also play a role in medication errors.

Study Outcomes

- Awareness of reasons for medication errors at WRAMC
- Increased awareness that fear of retribution remains a reason for not reporting errors
- Quarterly medication inservices for nursing staff by Pharmacy

Other Initiatives

- Look alike and sound alike meds
- Better systems for medication delivery to reduce missing doses and delays
- Medication Management Team – Nursing, Pharmacy, Medicine
- Feedback for reporting errors